

REMARKS

This amendment is responsive to the Office Action of June 12, 2003. Reconsideration of claims 1-23 is respectfully requested.

Claims 1-23 remain in the application.

Claims 1, 4, 6, 10, 11, 13, 16, 17, 19, and 23 are amended.

The Office Action

**Claims 1-13 and 16-22** were provisionally rejected under 35 U.S.C. §101 as claiming the same invention as that of claims 1-20 of co-pending Application Serial No.09/989,864, from which the present application claims priority as a continuation-in-part.

Applicants enclose herewith a notice expressly abandoning Application Serial No.09/989,864. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. §101 be withdrawn.

**Claims 1-4, 7-13, and 15-18** stand rejected under 35 U.S.C. §102(b) as being anticipated by Evian, et al. (U.S. Patent No. 5,125,019).

**Claim 5** stands rejected under 35 U.S.C. §103(a) as being unpatentable over Evian, et al. (U.S. Patent No. 5,125,019).

**Claims 14 and 23** were indicated as containing allowable subject matter.

The Present Application

The present application is directed to a cathode assembly which includes an insulator tube for electrically insulating a deflector from a base. The insulator has a bore

for receiving a rod connected with the deflector. The rod can slide within the insulator bore, allowing the deflector to be accurately positioned, relative to the filament during assembly. In the preferred embodiment, a metal alignment tube 146, 147 is connected in the bore of the insulator tube. The metal tube facilitates alignment and anchoring the rod against sliding.

The References of Record

Evian, et al. is directed to a an x-ray scanning tube. Electrodes 52, 53 are attached to insulator rods 50, 51, which, in turn, are attached to a metallic component 40. Conductors 58, 59 are insulated from the metallic component 40 by insulation 62. The conductors also pass through the insulator rods 50, 51 (Fig. 7). A filament 22 is positioned such that it is along a direct line of sight to the insulator rods 50, 51. As metal boils off the filament, it will plate on the insulators 50, 51, increasing the potential for arcing and shorting.

The Claims Distinguish Patentably  
Over the References of Record

Claim 1 has been amended to incorporate subject matter from original claim 4. Claim 1 now calls for a cathode assembly including an insulator for electrically insulating a deflector from a base, the insulator defining a bore. A metal guide tube is mounted in the bore. A rod connected with the deflector is received within the guide tube.

Evian, et al. makes no suggestion of placing a metal guide tube within the bore of an insulator. The Examiner points to element 62 of Evian as constituting tubular means. However, Evian's insulator 62 is positioned in the metallic component, to insulate the metallic component from a conductor 58, 59. There is no suggestion of adding a metal tube through the insulator 62 of Evian nor any motivation for doing so.

In the present application, tubes 146, 147, 146', 147' facilitate assembly of the cathode assembly. The tubes can be brazed to the insulators, prior to installation of the rods, and the rod can slide up or down in the tube to allow correct positioning of the deflector. Once this is achieved, crimping and welding the rod to the tube fixes the deflector in the desired position.

Evian makes no suggestion of such an assembly and positioning method. Rather, Evian's insulator rods 50 and 51 are welded to the metallic component 40. Insulators 50, 51 fix the position of the electrodes -- there are no adjustment options.

Accordingly, it is submitted that claim 1, and claims 2-3, 5, 7-9, 12, and 15 dependent therefrom, distinguish patentably and unobviously over the reference of record.

Moreover, with respect to dependent **claims 7-8** the Examiner asserts that Evian shows a socket/hole or well to receive the end of the insulator and rod. Note socket 112 of the present application. However, Evian discloses merely that the metallic electrodes 52, 53 are attached to the insulating rod 50, 51 (col. 5, lines 1-5). There is simply

no suggestion of a deflector which defines a socket which receives a second end of an insulator, as called for in claim 7. Nor is there any suggestion of a deflector which defines a hole which extends into the deflector from the socket for receiving the first end of a rod, as called for in claim 8.

With respect to dependent **claim 9**, the Examiner further suggests that the deflectors of Evian have a large diameter for gap formation. It is unclear how this large diameter has any bearing on the formation of a gap in the device of Evian, since the deflector of Evian has no socket which has a larger diameter than a diameter of the insulator as claimed in claim 9.

**Claim 6**, against which no references were raised, has been placed in independent form including all of the limitations of original claim 1, and thus claim 6 and dependent claims 4 and 14 are submitted to be patentable.

**Claim 10** has been placed in independent form and now calls for cathode assembly with a deflector carried by a base which defines a well and a rod received with the well of the deflector adjacent a first end of the rod, such that an insulator is connected with the deflector through the rod and does not itself contact the deflector.

Amendments to claim 10 are supported by Figures 5 and 8.

Evian makes no suggestion of an insulator being connected to a deflector via a rod which is received within a bore of the insulator and wherein the insulator does not itself contact the deflector. Evian's insulator 50, 51 makes direct contact with the electrodes 52, 53.

The presently claimed arrangement provides further insulation of the deflector from the base by providing a gap between the insulator and the deflector. When the x-ray tube is evacuated, the vacuum gap acts as a particularly effective insulator. This is not disclosed or suggested by Evian.

Accordingly, it is submitted that claim 10 distinguishes patentably and unobviously over the reference of record.

**Claim 11** has been placed in independent form and calls for an insulator for electrically insulating a deflector from the base and having a metallized coating on a first portion thereof. The insulator is brazed or welded to the base at the metallized coating.

Evian makes no suggestion of an insulator which has a metallized coating, nor does Evian suggest an insulator being brazed or welded to a base at a metallized coating. Evian discloses insulators formed from alumina which are welded to the metallic component 40 and which are attached to the electrodes 52, 53. Evian discloses that molybdenum deflectors can be used, which are welded to the alumina insulating rods. There is no suggestion of using a metallized coating on Evian's alumina insulators.

The present applicants have found that a coating, such as molybdenum-manganese or tungsten-manganese, on the insulators provides for improved brazing of the components.

Accordingly, it is submitted that claim 11 distinguishes patentably and unobviously over the references of record.

**Claim 13** has been placed in independent form and calls for a deflector which is configured and positioned to eliminate a direct line of sight over which vaporized filament material can move between a filament and an insulator.

Evian makes no suggestion of positioning a deflector in this manner. In Evian's assemblies there is a clear line of sight between the filament and the insulator rods.

The present inventors have found that filament material, over time, tends to evaporate and deposit on adjacent surfaces, particularly those in a direct line of sight. Such deposition can, over time, reduce the efficiency of the insulator by providing an electrically conductive path. By placing the insulators out of the line of sight of the filament, deposition on the insulators is reduced or eliminated.

Accordingly, it is submitted that claim 13 distinguishes patentably and unobviously over the references of record.

**Claim 16** has been amended and now calls for an x-ray tube with an insulator, a rod, and a deflector adjacent a first end of the rod, the rod being received within an alignment tube which, in turn, is mounted in an insulator bore.

Evian does not disclose a tube mounted in the bore of an insulator which receives a rod. The Examiner points to the insulator 62 of Evian as being a tubular means. However, there is no suggestion of another tube in Evian's

insulator 62 between the insulator 62 and the conductor 58,  
59.

Accordingly, it is submitted that claim 16 distinguishes patentably and unobviously over the reference of record.

Claim 17 now calls for a method of assembling a cathode assembly which includes attaching a rod to a deflector. A metal tube is attached in an insulator to define a bore for receiving the rod. The insulator is attached to a base. To mount the deflector to the base, the rod is slid into the tube and position an adjustably selectable distance from the base. The deflector is then attached at the selected distance.

Evian fails to disclose such a method. In particular, there is no suggestion in Evian of attaching a metal tube in an **insulator** to define a bore for receiving a rod or of sliding a rod into such a tube and attaching it thereto. Further insulators 50, 51 fix the electrode-base spacing.

The present applicants have developed a method which allows a deflector to be positioned relative to a filament on the base, in a convenient and accurate manner. The majority of the cathode assembly can be assembled, including positioning of the filament. The deflector can then be quickly positioned by sliding the rod in the tube and fixing the position by crimping the tube or the like. Evian's assembly does not allow for this relative positioning.

Accordingly, it is submitted that claim 17, and claims 18 and 20-22 dependent therefrom, distinguish patentably and unobviously over the reference of record.

**Claim 19, against which no references were raised,** has been placed in independent form. It is therefore submitted that claim 19 is in condition for allowance.

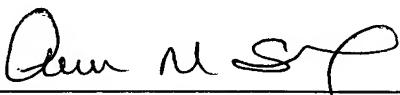
**Claim 23, which was considered to contain allowable subject matter,** has been placed in independent form. It is therefore submitted that claim 23 is in condition for allowance.

**CONCLUSION**

For the reasons set forth above, it is submitted that claims 1-23 distinguish patentably and unobviously over the references of record. An early allowance of all claims is earnestly solicited.

Respectfully submitted,

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